Application No. 09/742,229
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Attorney Docket No. 123-005

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, and listings, of the claims in this application:

1. (Canceled)
2. (Canceled)
3. (Canceled)
4. (Canceled)
5. (Canceled)
6. (Canceled)
7. (Canceled)
8. (Canceled)
9. (Canceled)
10. (Canceled)
11. (Canceled)
12. (Canceled)
13. (Canceled)
14. (Canceled)
15. (Canceled)
16. (Canceled)
17. (Canceled)
18. (Canceled)
19. (Canceled)
20. (Canceled)
21. (Canceled)

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22. (Canceled)

23. (Canceled)

24. (Canceled)

25. (Canceled)

26. (Canceled)

27. (Canceled)

28. (Canceled)

29. (Canceled)

30. (Canceled)

31. (Canceled)

32. (Canceled)

33. (Canceled)

34. (Canceled)

35. (Canceled)

36. (currently amended) At a source node, a method of data switching comprising:

receiving data segments, each of said data segments belonging to a data stream from among a plurality of data streams;

writing said each of said data segments in a payload memory device;

selecting a particular data stream from among said data streams for transmission by said source node, the particular data stream selected according to a bit-rate allocation to each of the data streams; and

if there is at least one data segment in said payload memory device belonging to said particular data stream:

assigning to said particular data stream a current output channel from among a plurality of output channels, said current output channel being selected to provide equitable distribution of said particular data stream across the plurality

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of output channels;

enqueueing a selected data segment belonging to said particular data stream in a buffer associated with said current output channel; and

transmitting said selected data segment over said current output channel.

37. (Canceled)

38. (currently amended) The method of claim 36 ~~37~~ including a further step of determining said bit-rate allocation according to a process of admission-control of each of said data streams.

39. (currently amended) The method of claim 36 wherein said current output channel has a logical relationship to a ~~said~~ previous output channel.

40. (previously presented) The method of claim 39 wherein said logical relationship is an adjacency relationship.

41. (Currently amended) The method of claim ~~36~~ 39 wherein said current output channel and said previous output channel are specific to said particular data stream.

42. (Currently amended) The method of claim 36 ~~including a further step of associating~~ wherein each of said data streams in said plurality of data streams is associated with a sink node from among a plurality of sink nodes.

43. (Currently amended) A source node comprising:

a plurality of input ports;

a plurality of output ports;

a payload memory device for storing data segments received from said plurality of input ports, each of said data segments associated with one of a plurality of predefined data streams;

a first memory device logically partitioned into primary queues each of said primary queues associated with one of said predefined data streams and holding addresses in

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said payload memory of data segments belonging to said one of said predefined data streams;

a second memory device logically partitioned into secondary queues, each of said secondary queues associated with an output port from among said plurality of output ports;

a first controller for regulating transfer of ~~selected~~ addresses from each of said primary queues to said second memory device; and

a second controller for equitably distributing said ~~selected~~ addresses from each of said primary queues among selected secondary queues.

44. (Previously presented) The source node of claim 43 wherein each of said secondary queues is associated with an output port from among said plurality of output ports.

45. (Canceled)

46. (Previously presented) The source node of claim 43 wherein said first controller is a service-rate controller operable to:

receive bit-rate allocations, one bit-rate allocation for each of said predefined data streams, from a service-quality controller performing a function of admission control of said predefined data streams;

select a particular primary queue from among said primary queues based on said bit-rate allocations; and

determine an instant of time for transferring a data segment from said particular primary queue.

47. (Currently amended) The source node of claim ~~43~~ 46 wherein said service-quality controller frequently updates said bit-rate allocations for said predefined data streams.

48. (Canceled)

49. (Previously presented) The source node of claim 43 wherein said second controller is operable to:

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associate a current secondary queue from among said plurality of secondary queues with each primary queue in said plurality of primary queues; and

update said current secondary queue associated with said each primary queue when a data segment is transferred from said each primary queue.

50. (Previously presented) The source node of claim 44 wherein each of output ports associated with said selected secondary queues transmits signals over a wavelength channel in a wavelength-division-multiplexed link.

51. (Previously presented) The source node of claim 43 further including an output interface for transmitting data segments from said payload memory device over said wavelength-division-multiplexed link, said particular data segments determined by addresses in said selected secondary queues.

52. (Previously presented) A network comprising:

a plurality of source nodes;

a first plurality of cross connectors;

a plurality of core nodes;

a second plurality of cross connectors;

a plurality of sink nodes; and

a plurality of multi-channel links connecting said sources nodes to said first plurality of cross connectors, said first plurality of cross connectors to said core nodes, said core nodes to said second plurality of cross connectors, and said second plurality of cross connectors to said sink nodes;

wherein said first plurality of cross connectors is configurable to provide multi-channel paths from each of said source nodes to at least one of said core nodes; and

wherein each of said source nodes sends data streams to at least one of said sink nodes and regulates the bit rate of each of said data streams;

and

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wherein each of said source nodes divides data of each of said data streams equitably among channels of a selected multi-channel path.

53. (Previously presented) The network of claim 52 wherein at least one of said core nodes includes a plurality of parallel switch planes, each of said switch planes connecting to a single channel from each of a selected subset of said multi-channel paths.

54. (Previously presented) The network of claim 53 wherein said second plurality of cross connectors is configurable to provide multi-channel paths from each of said core nodes to at least one of said sink nodes.

55. (Previously presented) The network of claim 52 further including at least one multi-channel link directly connecting at least one of said source nodes to at least one of said core nodes, thereby bypassing said first plurality of cross connectors.

56. (Previously presented) The network of claim 53 wherein each of said switch planes has its own scheduler for scheduling transfer of data across said each of said switch planes.

57. (Previously presented) The network of claim 53 wherein at least one of said switch planes includes an optical switch.

58. (Canceled)

59. (Currently amended) The source node of claim ~~58~~ 60 wherein said logical relationship is an adjacency relationship determined according to a round-robin selection process of channels of said particular multi-channel link.

60. (Currently amended) ~~The~~ A source node ~~of claim 58 further~~ having a plurality of multi-channel links connecting to core nodes in a network, each of said links comprising a respective plurality of channels, said source node operable to:

determine, for each multi-channel link in said plurality of multi-channel links:

a first merit index based on a known propagation delay along said each multi-channel link, said first merit index having a first upper bound corresponding to a lowest propagation delay;

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a second merit index determined based a current vacancy of said each multi-channel link, said second merit index having a second upper bound corresponding to full vacancy in said multi-channel link; and

a composite merit index determined as a sum of said first merit index and said second merit index;

retain, in a control table, an identifier of a last-used channel in each of said multi-channel links for each data stream from among a plurality of data streams originating from said source node;

receive a data unit belonging to a particular data stream from among said data streams;

select a particular multi-channel link from among said plurality of multi-channel links according to a desired distribution of data streams over the plurality of multi-channel links;

ascertain, using said control table, a particular last-used channel by said particular data stream in said particular multi-channel link; and

transmit said data unit over a particular channel in said particular multi-channel link, said particular channel bearing a logical relationship to said particular last-used channel.

61. (Previously presented) The source node of claim 60 further operable to select said particular multi-channel link according to said composite merit index of said each multi-channel link.

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